

CLAIMS

What I claim as my invention is:

5 1. A method for securing bone screws to a bone plate the so called plate having through holes provided with isolated protrusions able to lock into the thread of the screw head, the method being performed in just one surgical action: inserting the bone screw through the hole of the bone plate at a selected orientation with respect to the plate whereby the
10 bone screw rigidly locks itself to the bone plate after tightening, achieving a good locking strength at any one of the selected angles.

 2. The method of claim 1 wherein the bone screw comprises:

- a) a threaded partial sphere head;
- 15 b) a threaded shank;
- c) wherein both threads are of substantially similar pitch; and
- d) wherein the thread of the bone screw head is a double entry thread.

 3. The method of claim 2 wherein the through hole of the plate
20 comprises:

- a) a partial sphere shape with its upper and lower edges removed in a frustoconical shape, creating an hourglass hole shape.
- b) a diameter approximately the same to the diameter of the screw head and;
- 25 c) a number of flat protrusions on its inner surface, said protrusions having a width bigger than its length, and which number is within 2 and 30.

4. The method of claim 2 wherein the through hole of the plate comprises:

- 5 a) a partial sphere shape with its upper and lower edges removed in a frustoconical shape, making an hourglass hole shape.
- b) a diameter approximately the same to the diameter of the screw head and;
- c) a number of flat protrusions on its inner surface, said protrusions having a circular cross section with equal width and length, and which
10 number is between 2 and 30.

5. The method of claim 1 wherein the bone screw is a self-drilling screw.

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6. The method of claim 1 wherein the bone screw is a self-tapping screw.

7. The method of claim 1 wherein the bone screw has a non
20 threaded shaft part.

8. The method of claim 1 wherein the bone screw comprises:

- a) a head generated by a rotating polygonal line;
- b) a threaded shank;
- 25 c) wherein both threads are of substantially similar pitch; and
- d) wherein the thread of the bone screw head is a double entry thread.

9. The method of claim 8 wherein the through hole of the plate comprises:

a) a combination of three or more frustoconical holes to reach an hourglass shaped hole.

5 b) a diameter approximately the same to the diameter of the screw head and;

c) a number of flat protrusions on its inner surface, said protrusions having a width bigger than its length, and which number is within 2 and 30.

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10. The method of claim 8 wherein the through hole of the plate comprises:

a) a combination of three or more frustoconical holes to reach an hourglass shaped hole.

15 b) a diameter approximately the same to the diameter of the screw head and;

c) a number of flat protrusions on its inner surface, said protrusions having a circular cross section with equal width and length, and which number is between 2 and 30.

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11. A method for securing a bone engaging member to a fixation device having a through hole to bone, the method comprising just one surgical action: threading the bone engaging member through the hole of the fixation device at a selected orientation with respect to the fixation device whereby the bone engaging member rigidly locks itself to the
25 fixation device after tightening, achieving a good locking strength at any one of the selected angles.

12. The method of claim 11 wherein the bone engaging member comprises:

- a) a threaded partial sphere head;
- 5 b) a threaded shank;
- c) wherein both threads are of substantially similar pitch; and
- d) wherein the thread of the bone engaging member head is a double entry thread.

10 13. The method of claim 12 wherein the through hole of the fixation device comprises:

- a) a partial sphere shape with its upper and lower edges removed in a frustoconical shape, creating an hourglass hole shape.
- b) a diameter approximately the same to the diameter of the bone
- 15 engaging member head and;
- c) a number of flat protrusions on its inner surface, said protrusions having a width bigger than its length, and which number is within 2 and 30.

20 14. The method of claim 12 wherein the through hole of the fixation device comprises:

- a) a partial sphere shape with its upper and lower edges removed in a frustoconical shape, making an hourglass hole shape.
- b) a diameter approximately the same to the diameter of the bone
- 25 engaging member head and;

c) a number of flat protrusions on its inner surface, said protrusions having a circular cross section with equal width and length, and which number is between 2 and 30.

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15. The method of claim 11 wherein the bone engaging member is self-drilling.

10 16. The method of claim 11 wherein the bone engaging member is self-tapping.

17. The method of claim 11 wherein the bone engaging member has a non threaded shaft part.

15 18. The method of claim 11 wherein the bone engaging member head comprises:

- a) a head generated by a rotating polygonal line;
- b) a threaded shank;
- c) wherein both threads are of substantially similar pitch; and
- 20 d) wherein the thread of the bone engaging member head is a double entry thread.

19. The method of claim 18 wherein the through hole of the plate comprises:

- 25 a) a combination of three or more frustoconical holes to reach an hourglass shaped hole.

- b) a diameter approximately the same to the diameter of the bone engaging member head and;
- c) a number of flat protrusions on its inner surface, said protrusions having a width bigger than its length, and which number is within 2 and 5 30.

20. The method of claim 18 wherein the through hole of the plate comprises:

- a) a combination of three or more frustoconical holes to reach an 10 hourglass shaped hole.
- b) a diameter approximately the same to the diameter of the bone engaging member head and;
- c) a number of flat protrusions on its inner surface, said protrusions having a circular cross section with equal width and length, and which 15 number is between 2 and 30.